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The most important step that was taken with reference to the survey of the Hawaiian Islands consisted in the determination of the longitude of Honolulu with reference to San Francisco, by the transmission of telegraphic time signals through the submarine cable lately completed by the Pacific Commercial Cable Company between California and the Island of Oahu. The important national interests in the Territory of Alaska, with the supervision and development of which this organization is charged, were not neglected during the period covered by the Report; for, besides taking a weighty part in the preparation of the data that were submitted to the Tribunal which made the Alaskan boundary award, four well-equipped surveying steamers were employed in astronomical, hydrographic, and topographic operations in Bering Sea, and in Icy Strait, Davidson Inlet, Controller Bay, and Prince William Sound.

L.

GEOGRAPHICAL RECORD.

AMERICA.

VALPARAISO'S HARBOUR TO BE RENDERED SAFE.—*El Puerto de Valparaiso*, just published in Chile, contains the report of the Commission appointed to investigate the plans of Mr. Jacob Kraus, a Dutch engineer whom the Chilian Government had employed to prepare a plan for safeguarding the harbour. Valparaiso is the leading Pacific port of South America; but its splendid deep-water bay has the disadvantage of opening wide to the sea, so that hurricanes and great storms enter it. In the past eighty years 378 vessels in the harbour were destroyed by storm. A year ago the passenger ship *Arequipa* foundered in the bay, with 100 souls. Mr. Kraus reported that on account of the depth of water it was impracticable to build a sea-wall across the wide entrance to the bay. His improvement contemplates the construction of basins and sea-walls along a part of the water front of sufficient capacity to accommodate all the shipping. The Commission examined the topographic, geological, technical, financial, and other conditions of the work, and, with some minor modifications, the plans of Mr. Kraus have been adopted. The cost of the improvements, including a dry dock, is computed at \$10,950,000. It is estimated that the tax on tonnage, together with the rentals of yards, sheds, and warehouses, will yield an income of \$793,800, and that the improvements will

save the trade of the port fully \$1,000,000 a year. The report of the Commission will be submitted by the Government to the Congress at its coming session, with the recommendation that the plans and specifications be adopted, and an appropriation be voted for the cost of the work.

DICTIONARY OF ALTITUDES IN CANADA.—Mr. James White, Geographer of the Department of the Interior, Canada, has prepared a "Dictionary of Altitudes in the Dominion of Canada," which is to be accompanied by a relief map of the Dominion on a scale of 100 miles to an inch. The list of elevations covers 143 pages. The latitude and longitude, taken from the latest maps and charts, and the authority for the figures of elevation are given with each locality. The list is not presented as absolutely accurate, but as the best interpretation of conflicting evidence available at the present time. The work is supplementary to the earlier volume, "Altitudes in Canada," which will doubtless be found more useful for the purpose of civil engineers; but the present book, with its alphabetical arrangement by provinces and territory, is more convenient than the other for the general public. Any one, for example, desiring to find the altitude of a railroad station, and ignorant of the name of the railroad line on which it is situated, may readily turn to it.

AFRICA.

A WATERWAY FROM LAKE CHAD TO THE ATLANTIC.—Capt. Lenfant has returned to France after the successful achievement in West Africa of a very arduous undertaking. He has proved that the long-conjectured through waterway between the Benue tributary of the Niger and the Logone-Shari River system emptying into Lake Chad really exists. He has thus established direct communication between Lake Chad and the Atlantic, though unfortunately the conditions are such as greatly to modify its value for transportation. His journey was up the Benue River on a small steamer to the Mayo-Kebbi, which he was the first to ascend above Bifara. The current became quite rapid in the upper part of the Mayo-Kebbi, and at the village of Lata, about fifty miles above Lere, he found that the river runs in a deep gorge with precipitous walls, where its course is broken by rapids and falls. Only 13 miles east of the point where his progress was impeded is the depression of Tuburi, bordering the water-parting between the Chad and Niger systems. But the Tuburi depression is 360 feet above his halting-place at Lata, and the upper Mayo-Kebbi leaves the lake in the

Tuburi depression and reaches Lata by a series of rapids and three cascades, which form the fine falls of M'Burao.

Of course the existence of these falls and rapids made a portage necessary. Capt. Lenfant took his boat to pieces, and porters carried it in sections to Gurunsi, on the Tuburi. Here the boat was put together and navigation was resumed. The Tuburi is an extensive marsh, with banks about 16 feet in height. It has a length of 65 miles, and is covered with pools and grassy plains, upon which rice is cultivated. Between the Tuburi and the Logone River lies a depressed area, from a mile and a quarter to two miles in width and about 13 miles long, which resembles a narrow park with grassy swards, trees, and villages. This is the water-parting between the two great river systems. At one side is a feebly-marked river bed covered with pools and water holes, connected by stretches of shallow water and partially overgrown with vegetation. When the expedition reached this point the period of high water had passed, but from the water mark they decided that the maximum depth had been 4.52 feet. The period of highest water usually lasts for six weeks, from Aug. 15 to Oct. 1, and during this time vessels drawing three feet of water may pass without difficulty; while for a further period, from July 20 to Oct. 25, navigation is possible for vessels drawing two feet.

The object of this expedition was primarily economic. At present France transports its supplies for the French stations on and near Lake Chad by the long and enormously expensive route of the Congo, Mobangi, and Shari Rivers. The cost by the route is about 2,000 francs a ton. Capt. Lenfant says that by the route he has discovered the transportation of supplies should take only sixty-nine days, as against the five months which the Congo route involves, and that the cost of transport would be reduced to 500 francs per ton. By the longer route the loss in deterioration of commodities is about one-half; while, according to Capt. Lenfant, it would only be about 1 to 2 per cent. by the shorter route. Of course freight would have to be transshipped around the gorges of the upper Mayo-Kebbi; but the greatest disadvantage would be that the route would be available for only about four months in the year. It was Lenfant who succeeded in carrying an enormous quantity of supplies through the rapids of the middle Niger where the river was thought to be unnavigable; and he is likely to be entrusted with the work of practically testing the availability of the new water connection he has discovered.

GIVING EGYPT ALL THE WATER IT NEEDS.—The Society has received from Sir William Willcocks, late Director-General of Reservoirs in Egypt, a copy of his lecture delivered before the Khedivial Geographical Society of Cairo on January 16, in which he discusses his plan for supplying Egypt with all the water required for its perennial irrigation. Egypt has a total irrigable area of 6,250,000 acres. Of this area, 250,000 acres, along the edge of the desert, are now and must continue to be inundated in flood, to prevent the sands of the desert from spreading over the Nile valley. Four million acres are perennially irrigated. Of the remaining 2,000,000 acres, two-thirds are irrigated only in flood, and one-third is not irrigated at all. The problem is how to provide perennial irrigation to these 2,000,000 acres, and so add £60,000,000 to the wealth of the country.

To give all the agricultural lands perennial irrigation, Egypt requires reservoirs capable of storing four milliards of cubic metres of water.

The Assuan reservoir, at its present level, contains one milliard of cubic metres of water, which will suffice for the conversion of 500,000 acres to perennial irrigation. But though the dam was only completed at the end of 1902, the whole of the water is already devoted to special tracts, and the Government is compelled to refuse all applications for water; and yet the provision of the remaining three milliards of water is well within the competence of the country.

Sir William sums up the financial situation of the Government to show that it will be justified in incurring the expenditure for this improvement.

When he designed the dam at Assuan he provided that it should be so built that it might be raised six metres in height and hold up another milliard of cubic metres of water. The cost of this improvement would be £500,000. The projected Wady Rayan reservoir would be well able to supply the two remaining milliards of cubic metres of water when working in conjunction with the Assuan reservoir thus improved. The Wady Rayan, where it is proposed to build this reservoir, is a depression in the desert to the south of the Fayum, and southwest of Cairo. When the Assuan reservoir is made capable of supplying two milliards of cubic meters of water, it will be possible to utilize the Wady Rayan reservoir to its fullest capacity. Working together, the two will easily provide all the water needed for the perennial irrigation of Egypt.

THE CAPE TO CAIRO RAILROAD.—The Cape to Cairo Railroad, it was announced in March, would be completed in April this year to the Zambezi, and the first through train, from Cape Town to the Zambezi, would be despatched from Cape Town late in April or early in May. On the first of February the track had been extended northward to within 77 kilometres of Victoria Falls, and preparations were beginning for the building of the large iron bridge that is to cross the Zambezi at that point. A part of this structure is now on the way to South Africa, and the remainder will be shipped as soon as possible. It is hoped to complete the bridge before the end of the year. The present contract will be completed when the road is extended to Victoria Falls and the bridge is in place. The building of the next section, from the Zambezi northeast to Broken-hill, 563 kilometres, will begin at an early day.

WHITE POPULATION OF THE CONGO FREE STATE.—On January 1, 1903, the Congo State contained 2,365 foreign inhabitants, of whom 1,417, or more than one half, were Belgians. The other foreigners were: 149 Italians, 136 Swedes, 119 Britons, 108 Portuguese, 104 Dutch, 67 Germans, 52 Swiss, 42 French, 41 Americans, 36 Danes, 27 Norwegians, 12 Russians, 8 Austrians, etc. The districts containing the largest number of whites were Boma, 447; Stanley Pool, 306; the Eastern Province, 285; districts of the Lualaba-Kasai, 208; the Equator, 205; Matadi, 184; the Welle-Makua, 174; Bengala, 148; the Cataracts, 132.

NAVIGATION IN KATANGA.—*Le Mouvement Géographique* (No. 15, 1904) publishes the first part of the results of investigations by Mr. Lattes, who has been studying the question of the navigability of the Lualaba and its tributary, the Lufira, for the Special Committee of the Katanga. He reports that the Lualaba is navigable for steamers from Konde Rapids (about 9° 10' S. Lat.) to the Dia rapids (about 5° 20' S. Lat.), a distance of about 640 kilometres. In this long stretch there is no serious impediment to navigation, except that it is a little difficult at high water where the river emerges from Lake Kisale. The population along the banks between Konde Rapids and Lake Kisale is very dense. From Nyongo to Katowe an uninterrupted series of villages and plantations lines the banks, so that it will be difficult to procure wood for the steamer furnaces. The natives of this region are unspeakably lazy, and it will not be easy to arouse them from their habit of almost complete idleness. The lower Lufira is navigable for steamers for 54 kilometres above Lake Kisale, but only during a part of the year.

ZOOLOGICAL COLLECTIONS IN AFRICA.—Cairo is one of the most important entrepôts for the collection of wild animals. The *Report* of the Public Works Department in Egypt for 1902 says that during that year the staff of the Giza Zoological Gardens were intrusted with bringing 90 live animals from the Sudan to Giza, including specimens for the Khedive and foreign zoological gardens. The animals included 10 lions, 4 leopards, 7 cheetahs, 4 giraffes, 11 antelopes, 2 Nuer cattle on the upper Nile, 1 antbear, 11 smaller mammals, 5 secretary birds, 3 shoebills, 17 storks, cranes, geese, etc., 7 tortoises, and 1 crocodile. Out of the 90 animals, 88 reached Giza in safety. The only accidents on the journey were the loss of a fine young roan antelope and a gray crane, which had been purchased in Khartum for the Giza Zoological Gardens, but died suddenly near Berber on an exceptionally hot day in May. The animals sent on from Egypt to the London, Dublin, Calcutta, and Pretoria Zoological Gardens all reached their destination in safety, except the antbear, which died at Marseilles on the way to London.

ASIA.

THE LOWER YALU RIVER.—The valley of the Yalu is now attracting wide attention, because the armies of Japan and Russia are marshalled in its neighbourhood. Mr. Robert T. Turley gives some description of the river in the April number of the *Geographical Journal*. The lower part of the river is several miles in width and the water rises and falls thirty feet at spring tides. The sand banks at low-water stretch for miles, and ships rest on them while their crews play cricket and other games. On account of ice, ships cannot enter the river from November 30 to the middle of March. On the Manchurian side, near the river mouth, is Tatung Ku, a wretched, dirty, low-lying town on a creek some distance from the river. It was utilized as a port before nearly all the sea trade was transferred to Antung, recently made a treaty port, ten miles further up the river. Both these towns stand only a little above sea-level, and have much sickness, as the water is scarcely potable. Antung is a thriving town of about 20,000 inhabitants, doing a large import and export trade with sea-going junks. It has a well-built Bund and a landing-place with a Custom-house. A few miles further up the river is Chiu Lien Cheng, a small village formerly of more importance, where the imperial road and the telegraph line from Mukden cross the Yalu and extend southward to Seoul. Across the river is some of the richest grain land in Corea; and up the river a short distance is the dilapidated old Corean city of Wiju,

once a famous political and trading centre. The Yalu narrows above Wiju, and is confined by hills, but is navigable for large junks up to the mouth of the Hün Chiang. Sailing up river, however, is rather slow work, as the current is usually strong. On the Corean side the hills are more or less parallel with the river, with valleys enfolding villages. On the Manchurian side numberless short valleys come down to the river roughly at right angles. These valleys are fairly wide, and cultivated. Trade is carried on along the river by mule cart or sledge in winter and in summer by shallow junks, which ascend for more than 200 miles in a direct line from Antung.

WATER FROM CLOUDS ON TABLE MOUNTAIN, SOUTH AFRICA.—In a recent number of the *Transactions of the South African Philosophical Society* (Vol. XIV, Pt. 4) there are presented some interesting facts concerning the supply of water which comes from the clouds over Table Mountain. The rainfall of this district is at a maximum in winter, only about eight per cent. of the annual precipitation coming in the three summer months (December to February). Sometimes two months may pass by at that season without a trace of rainfall. The vegetation, as a whole, is of a character which is adapted to a dry climate, but on the summit of Table Mountain itself plant life is notably more luxuriant. The reason for this is found in the fact that a supply of water comes from the clouds, which, during the southeast winds of summer, sometimes cover the upper portions of the mountains for a considerable length of time. Droplets of water from the clouds are then deposited on the plants, and the quantity of water thus collected may be considerable, as has been shown by actual measurement. This, it is to be noted, is not a case of a production, or of an increase of rainfall because of the presence of the vegetation, but simply a case of collecting water-drops which already exist in the atmosphere.

A similar phenomenon on Green Mountain, on the Island of Ascension, has been described by Professor Cleveland Abbe. The principal water supply of the naval station on the island comes from the summit of the mountain, several miles away. The upper portion of Green Mountain is covered with vegetation, and nearly all of the water on the summit comes from slight showers and the steady dripping from trees which are enveloped in the clouds. These trees, as in the case of the vegetation on Table Mountain, simply mechanically collect the water-drops which are produced from the condensation of the water vapour in the ascending, cooling air.

R. DE C. W.

EUROPE.

RELATIONS BETWEEN PRECIPITATION AND FLOW-OFF IN THE BASIN OF THE MAIN RIVER, GERMANY.—A paper with this title, presented by Maximilian von Tein at the Ludwig-Maximilian University of Munich, presents the following conclusions as the result of his observations: The annual precipitation above Miltenberg, comprising all but a small part of the Main basin, reached an average, in the twelve years, 1886-1897, of 13,700 millions cubic metres. The maximum rainfall occurred in July, with 1,690 million, and the minimum in February, with 760 million cubic metres.

The average annual discharge or flow-off of the Main at Miltenberg reached 3,900 million cubic metres. The greatest quantity was in March, with 650, and the smallest quantity in August and September, with 190 million cubic metres. Between March and May there is a rapid decrease in the discharge.

Precipitation and flow-off are not parallel. The maximum precipitation (July) is received at a time of comparatively small discharge; the largest flow-off (March) at a time of not very important precipitation. Fifteen to twenty per cent. of the underground water is used by vegetation, and at least 30 per cent. in fall and winter (October to December) is retained in the ground. The water thus reserved in fall and winter forms a resource which is utilized gradually in the following year, and particularly in the drier period, from August till September. The stand of water in the Main, in both these months, depends largely upon the amount of precipitation in the previous winter.

THE METEOROLOGICAL ASPECTS OF BIRD MIGRATION IN THE BRITISH ISLES.—For several years past (since 1880) the British Association, through a committee, has been carrying on an inquiry concerning the migration of birds in Great Britain and Ireland, the results of which are briefly summarized in *Nature* for March 31. Among the most important conclusions are those which concern these migrations in their relation to meteorological conditions—a subject which has never been sufficiently investigated. It appears that in the autumn the great arrivals of migrants from north-western Europe are correlated with a type of pressure distribution which gives fine weather over the North Sea between Scandinavia and the British Isles; but, although this fine weather prevails at the point of departure, and hence induces the migration, it may not extend as far as Great Britain. In this case the birds have to pass through more or less unfavourable weather before they reach their

destination. A study of the conditions during which birds cross the English Channel showed that no migrations occurred when the weather was at all unfavourable, but that the *direction* of the wind was not a controlling factor. No movements were performed with wind velocities over about 28 miles an hour. When the wind blew 34 miles the few birds observed were in distress. At higher velocities, approaching 40 miles an hour, the only birds observed were martins and swallows. The supposed influence of wind direction in inducing migration is believed to have been misunderstood. Wind direction, of course, depends on the distribution of pressure; but the pressure type, by producing favourable or unfavourable weather conditions, is the prime factor.

R. DEC. W.

POLAR.

THE FATE OF BARON VON TOLL.—According to a letter from Baron von Osten-Sacken to the *Geographical Journal* (April, 1904), hope of the return of the Russian Arctic explorer, Baron von Toll, had not been given up late in February, and rewards had been offered by the St. Petersburg Academy of Sciences for the discovery of the missing men, or of definite traces of them. The announcement of the Academy is as follows:

“Baron Edward Toll, leader of the polar expedition, organized by the Academy of Sciences, left Bennett Island in a southerly direction on Oct. 26 (Nov. 8), 1902. He was accompanied by the astronomer Seeberg and by two Yakuts, Vassily Gorokhov, surnamed Chichak, and Nicholas Protodiakonov, surnamed Omuk. All these persons appear to have been carried away by the ice in an unknown direction. The attempts hitherto made for their succor having remained without result, a reward of 5,000 rubles will be given by the Academy to any person or persons who may discover the expedition, either in whole or in part; and a reward of 2,500 rubles for any incontestable indication of traces likely to contribute to the success of the search.”

The *Novosti* of March 15, on the other hand, contains a letter signed Woldemar von Toll, in which the gloomiest view is taken of the fate of the baron and his companions, who, the writer thinks, must have perished in the Arctic deserts.

The *New York Tribune*, of April 22, published the following telegram:

St. Petersburg, April 21.—The last document left by Baron Toll has been found by Lieutenant Kolchak. It is dated at Paul Keppan Bay, Bennett Island, November 11, 1902, and is as follows:

Accompanied by Astronomer Seeberg and two traders, I left the winter quarters of the Zaria, in Nirpich Bay, on June 7. We proceeded by the northern shore of Kotelnyi and Thaddeus islands to Cape Vysoki, and on July 13 we headed for Bennett Island. The ice was rather broken on July 25, and we prepared to take to two baydars, native boats. Here we killed the last of our dogs.

The icefloe on which we camped carried us in four and a half days forty-eight miles on our course, but bearing off, we left it on July 31, crossing the remaining twenty-three miles to Bennett Island on the baydars, landing on August 3 at Cape Emma.

The document includes the results of the astronomer's survey of Bennett Island, which is shown to be an offshoot of the Central Asian plateau. It is composed of the oldest Cambrian strata, broken by outflows of basalt, which cover brown coal measures.

The remains of coniferous vegetation and the bones of mammoth and other quaternary animals were seen in the valleys. White bear and walruses and a herd of thirty reindeer were found, and the birds seen were gulls, eagles, falcons, and flocks of geese.

The conclusion is in these words:

Owing to the fog we could not see the land whence the birds came nor distinguish Sannikoff Land. We are leaving a number of recording photographic instruments and start for the south, provisioned for from fourteen to twenty days. All are well.

We are in 76 degrees 38 minutes north; 149 degrees 42 minutes east.

BARON E. TOLL.

EDUCATIONAL GEOGRAPHY.

A SCHEME OF GEOGRAPHY.—The exact meaning of the word "geography" and the content of the subject in elementary and secondary schools and universities, as determined by the needs of education and the meaning of the word, have long been under discussion. From ten to fifteen years ago much space was devoted to the topic "What Is Geography?" in the educational papers of the country. Since that time has come the modern awakening in geography teaching, with its many faddisms and its new and inspiring suggestions. In our enthusiasm, especially in elementary school work, we have in many cases lost sight of geography itself in our undue emphasis on certain phases of the subject as a whole. In our secondary schools and colleges the tendency toward subdivision has been even greater, until now there is hardly an university course in geography in the country, though there are very many in the subdivisions physical geography, meteorology, climatology, commercial geography, etc.

Many teachers have regretted this undue insistence upon the parts of geography, as though any part were greater than the

whole. In a recent article* Professor Davis has brought our thought back to the time-honoured subject of the meaning of geography, and the relation of its parts, and has done the cause of geographical education a great service. This article deserves careful attention not only from teachers, but from all interested in the cause of geography. The author recognizes that we have classified the causal or environmental side of geography with fair success, but that we have not paid sufficient attention to the consequential side, or to the relations between consequences and causes. He has proposed that we use the term *ontography* to include the field of organic responses to physical environment, and has suggested a means of classifying ontography, so that this field may in course of time be classified as thoroughly as the physiographic side is classified now. This is the field in which the larger amount of work remains to be done; this is the neglected phase of the subject which has been considered fragmentally hitherto, but which has never been organized. It is to be hoped that this renewed emphasis of the relations of geography may continue to occupy our thoughts and attention, and that geography as a whole may thereby profit greatly.

R. E. D.

A NEGLECTED PHASE OF COMMERCIAL GEOGRAPHY.—It is an interesting fact that, in all our exploitation of the nature and importance of commercial geography in education within the last five years, there has been a singular neglect of an extremely complicated but necessary side of the subject. Every text-book has insisted strongly on the physical controls of commerce, and some attention has been given to the effects of religion and language upon trade. Only scattered attention has, however, been given to the political economy of the subject. The causal elements involved in a study of commerce are the physical factors on one side and the human factors on the other. To give a true understanding of present commerce without taking into account the fiscal policy and the financial conditions of a country, or many phases of economics, some of them extremely minute in character, that influence a business man daily, is to neglect the side that may at times overturn all climatic and physical controls. This is undoubtedly a difficult subject to present to secondary pupils, but it must be done before commercial geography can be considered well or adequately presented.

R. E. D.

* A Scheme of Geography, *Geographical Journal*, October, 1903.

EDUCATIONAL GEOGRAPHY AT THE EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS.—The work in Educational Geography in this country has not hitherto been co-ordinated in such a way that the workers in one field necessarily knew the relations of their own work to that of their colleagues in the lower or higher schools. An opportunity for such an interchange of ideas will be given at the Eighth International Geographic Congress next autumn, and it is to be hoped that all teachers of geography, especially teachers in secondary and normal schools, and in universities, may co-operate earnestly to this end. Particular attention will be given to Educational Geography at the several sessions of the Congress, and experienced teachers are cordially invited to contribute to the programme. Papers must be limited to a length of twenty minutes, and, if possible, of twelve minutes; and must be approved by the programme committee. All who desire to take part should communicate at once with Professor Richard E. Dodge, Teachers College, Columbia University, New York City, stating the topic of the proposed paper and the time allowance desired. A brief abstract should accompany the application, if possible.

R. E. D.

OBITUARY.

SOPHUS RUGE.—Prof. Sophus Ruge, the eminent German geographer, died at Dresden on Dec. 23, 1903. Geography was his favourite study from boyhood. Graduating from the University of Göttingen in 1857, he became a teacher, and after 1859 resided at Dresden, first as a teacher in a commercial school, and since 1874 as Professor Ordinarius of geography and ethnography at the Polytechnicum. He wrote two excellent text-books, which passed through many editions. But he was best known for his labours in connection with the history of geography. Among his numerous papers were: "Über Compass und Compass Karten," Dresden, 1868; a second edition of Peschel's "Geschichte der Erdkunde," 1877; "Geschichte des Zeitalters der Entdeckungen," Berlin, 1888; twelve "Abhandlungen und Vorträge zur Geschichte der Erdkunde," Dresden, 1888; "Life of Columbus," 2nd Edition, Berlin, 1902; an historical essay on the cartography of America, published as a supplement of Petermanns Mitteilungen; a paper in the Festschrift of the Hamburg Geographical Society on the discovery of the New World; the article on cartography in the Encyclopædia Britannica; and bibliographical reports in Wagner's Jahrbuch.

GENERAL.

GEOGRAPHISCHER ANZEIGER.—This publication, now in its fifth year, issuing from the house of Justus Perthes, Gotha, will hereafter be completely identified with the interests of geographical education. It appears in a new and very neat dress, and the subscription price for the twelve numbers of 1904 is 6 marks. It treats of such phenomena as the wearing away of the Baltic coast of Germany by wind, rain, and other agencies, in language that adapts the matter for class-room reading. Geographical news of the day, such as the report on the sand-buried ruins of Khotan, are told from the point of view of the school. Thus portions of the magazine are adapted for the student, while other parts are especially meant for the teacher. The concise book reviews, and, in fact, all the departments are full of hints and suggestions that many teachers will be eager to utilize.

DISTRIBUTION OF THE YELLOW FEVER MOSQUITO.—Dr. Howard has written a brief report on the geographical distribution of the yellow fever mosquito, which is published by the United States Public Health and Marine Service. He records the various localities where the mosquito has been met, and draws the conclusion that it may be expected to be present in all regions whose climate is not too dry, between latitudes 38° N. and 38° S., in which the sum of the daily mean temperature above 43° F. amounts to 18,000° F. for the year.

RIDDING ISMAILIA OF MOSQUITOES.—The Liverpool School of Tropical Medicine reports (Memoir XII) that in 1892 Major Ross went to Ismailia, on the Suez Canal, at the invitation of the Canal Company, to suggest a method of ridding the town of mosquitoes. He advised filling in the marsh land, flushing and cleansing the drainage channels weekly, and also petroleum treatment for drains and waste water that does not soak away. Prof. Boyce has just reported that as a result of this campaign the mosquitoes are now no more abundant in Ismailia than in Paris. Cases of malaria have also diminished from 1,555 in 1902 to only 209 in 1903. These gratifying results have been accomplished by an expenditure of \$22,000 in the initial cleansing operations; and it is estimated that the annual outlay will not be more than \$3,600.

LENGTH OF QUATERNARY TIME.—As a result of studies in the Kern Basin region of the Californian Sierras, Lawson (Bull. Dept. Geol. Univ. of California, Vol. 3, 1904, pp. 291-376), makes an

estimate of the length of the Quaternary time as 2,751,000 years. This estimate is based upon the division of the Quaternary period into four parts, and the establishment of ratios for the work performed in each division. The time since the disappearance of the glaciers is taken as 1; the Glacial Period as 50; the period of cañon-cutting 300; and the time required for the development of the broad high valleys as 2,400. Assigning to the post-glacial time 1,000 years gives to the Quaternary time the startling length in years above stated. There are few, if any, geologists who would accept this estimate as of any particular value; indeed the author's own statement leads one to believe that he places little value on it, and has merely allowed himself to indulge his fancy in a speculative calculation. He states that "he has ventured to make a guess," and that the figures "have not much value." Nevertheless the newspapers of the country have gravely printed his results as if they were established.

R. S. T.

TWO NEW PHYSIOGRAPHIC TERMS.—With the development of a new science nomenclature becomes necessary, and it is for this reason that as a result of the scientific study of the evolution of land-forms a large number of new physiographic names have been proposed in the last few years. Many of these names have survived and attained a permanent place in geographic nomenclature; still more have gasped at birth, and then passed into oblivion. Lawson (Bull. Dept. Geol. Univ. of California, Vol. 3, 1904, pp. 391-376) has just proposed two additions—*kernbut* and *kerncol*—to the list. A kernbut is a butte-like hill, or a buttress, on the cañon side, occurring typically in Kern Cañon, California; it is separated from the cañon wall by a low sag or col, the kerncol. The origin of these land-forms is fully discussed by Lawson, and in the case of the occurrences in the Kern Cañon they are assigned to rifting of the granite, opening fissures.

R. S. T.

ANNUAL AWARDS OF THE ROYAL GEOGRAPHICAL SOCIETY.—The Council of that Society awards the Founder's Medal this year to Sir Harry Johnston for the many valuable services he has rendered during over twenty years towards the exploration of Africa, West and East, North and Central; the Patron's Medal is awarded to Commander Robert F. Scott, R. N., leader of the British Antarctic Expedition, especially for his great sledge journey to 82° 17' S.; the Murchison Grant is awarded to Lieut. Colbeck for his admirable conduct of the Antarctic relief expeditions; the Gill Memorial to

Capt. Irizar of the Argentine Navy for his successful relief of the Swedish Antarctic Expedition; the Cuthbert Peek Grant to Don Juan Villalta for important exploring work to the east of the Andes, and the Back Grant to Dr. M. A. Stein for his valuable geographical work in Central Asia.

WIND-BLOWN TREES.—Among the many simple non-instrumental meteorological observations which travellers may make, perhaps none is of more general interest and value than those which concern the unsymmetrical growth of trees under the action of the prevailing winds. A recent illustrated paper on the subject of wind-blown trees, by Professor M. S. W. Jefferson, appeared in the *Journal of Geography* for January last, and a very complete study of the whole matter, by Professor J. Früh (*Die Abbildung der vorherrschenden Winde durch die Pflanzenwelt*), has also recently been published (*Jahresber. geogr.-ethnogr. Gesell. Zürich, 1901-02*), with a full bibliography. Here is a brief summary of Professor Früh's monograph:

The unsymmetrical growth of trees may be ascribed to a number of factors, among which the following are of the greatest importance: 1. The exposure, as in valleys, on slopes, ridges, plains, etc. 2. The nature and condition of the soil, upon which the stability of the trees so largely depends. 3. The stage of development of the trees, *i. e.*, the influence of the roots, the size, distribution, and number of the leaves. 4. Secondary conditions, as the weight of snow or ice on the trees; the removal of some protection, as through deforestation, and the like. Trees grow unsymmetrically when they receive light from one side, or when they are habitually overloaded on one side with snow, hoar frost, or creepers, and also, and very largely, under the mechanical or physiological effect of wind. With the mechanical effects may be combined the chemical effects of frost, which injures the leaves, while physiologically the effect is one of desiccation.

The general effects of prevailing winds upon trees may be classified according to the different forms produced, as follows: 1. Vertical trunk, but absence of branches on the windward side of the tree. 2. Top of the trunk inclined in the direction of the prevailing wind, the crown being unsymmetrically developed. 3. Trees very much inclined, the branches being almost one above the other. The size of the trees decreases towards the windward side of the forest. 4. Trunk and crown may be deflected in different directions, the trunk being turned by strong but temporary winds, while the

crown shows the direction of the prevailing winds. These effects are all seen chiefly in districts bordering the ocean. The different type-forms of wind-blown trees are illustrated by means of a sketch (Fig. 3, p. 24), and the kinds of trees most susceptible to this influence are noted (pp. 28-30).

A large portion of this excellent report deals with the results of observations made in different parts of the world on trees which have grown unsymmetrically under the influence of the general winds, and also under the control of local winds, such as the föhn, mistral, bora, and mountain and valley breezes. Taken as a whole, Professor Früh's study is a noteworthy contribution to the *living* side of climatology, and it will doubtless turn the attention of travellers to the observation of trees as wind vanes. Such an investigation as this cannot fail to enliven the study of local climatology. Everything that concerns the relation of atmospheric conditions and life, whether animal or vegetable, deserves more attention than it has hitherto received. R. DEC. W.

PERSONAL.

Prof. Dr. Joh. von Ranke, of the University of Munich, has been elected an honorary member of the Swedish Anthropological and Geographical Society.

Prof. A. Philippson, of Bonn University, who has given much time in recent years to geographical and geological investigations in Greece, will engage, during the coming summer, in explorations in Asia Minor, using the Wentzel-Heckmann grant of the Berlin Academy.

Prof. Robert Koch, who has been visiting Dar es Salâm, the capital of German East Africa, studying malaria and the prevalent cattle disease, will return to Berlin at the end of June.

M. Gentil, the well-known African explorer, has been appointed Commissioner-General of the French Congo territory under the new administrative régime, dividing the vast region into four districts for more effective and economical government. His headquarters will be at Brazzaville, whence he will administer the affairs of the middle Congo, and have supervision over those of the other districts.

THE U. S. GEOLOGICAL SURVEY, at the request of the Peruvian Government, has sent Dr. George I. Adams to Peru to organize a service for hydrographic work.